FAST Ultrasound
More Information: FAST Pericardial (subcostal) – Technique / Normal Findings

The pericardial view is obtained using a subcostal or transthoracic window. The subcostal window is initiated by placing the transducer in the subcostal space with the transducer indicator directed toward the patient's right, while scanning directly posterior using the left lobe of the liver as a window (Figure 9).

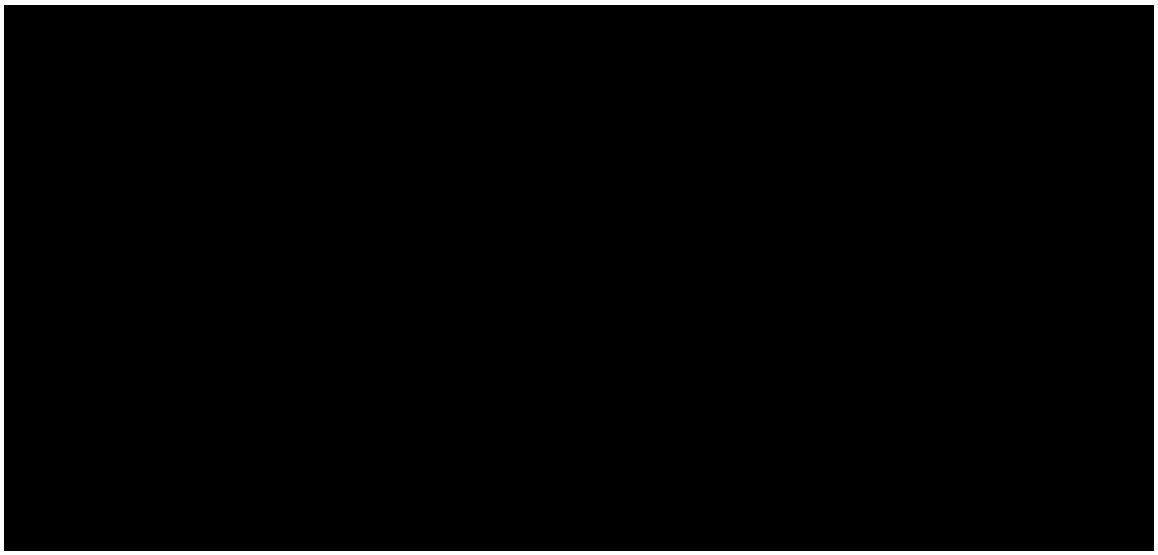

Figure 9. Transducer placement for visualization of the left lobe of the liver and inferior vena cava. The white circle identifies the direction of the transducer indicator.

The inferior vena cava (IVC) is identified and the transducer is gently angled in a cephalad direction following the inferior vena cava until it goes into the right atrium (Figure 10) (Video 1). The transducer can then be gently angled and/or tilted until the four-chamber subcostal view is identified (Video 1).

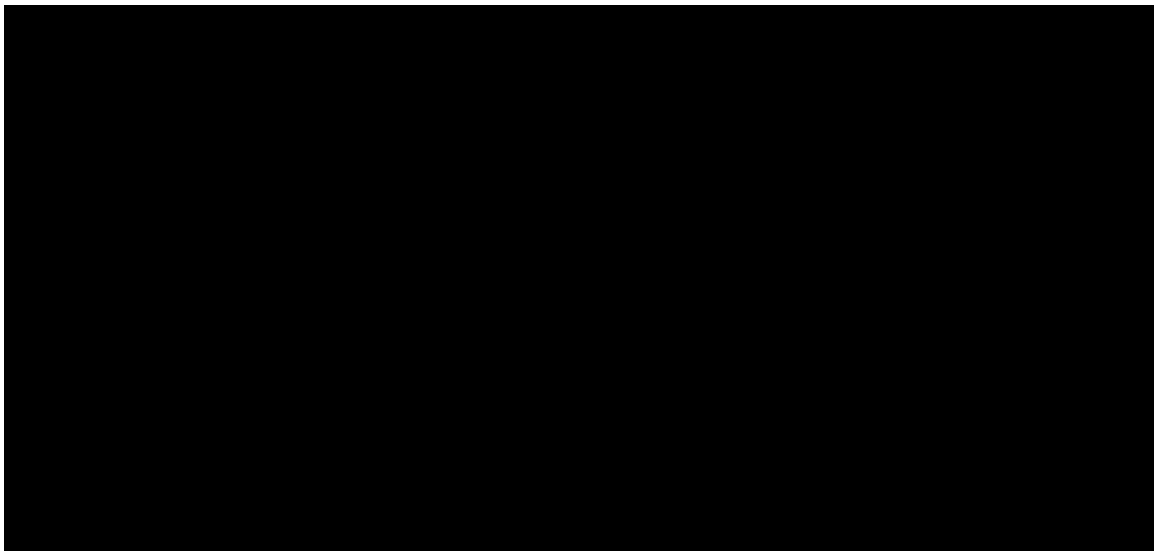

Figure 10. Transducer placement for the subcostal window. RV=right ventricle, LV=left ventricle, LA=left atrium, and RA=right atrium.

Video 1. Transducer movement used to obtain the 4 chamber, subcostal window.

If the desired view cannot be obtained through slight movements of the transducer, then have the patient take in a deep breath and hold it (Video 2). This maneuver will flatten out the diaphragm and bring the heart closer to the transducer.

Video 2. The effect of having the patient take in a deep breath on cardiac visualization during subcostal scanning. Note when the video begins, the heart cannot be visualized and it is only after the patient takes the deep breath that the heart becomes visualized.

The subcostal window can also be obtained in the sagittal orientation. This orientation is frequently described in the trauma surgery literature.[39] To obtain this view, the transducer is placed in the subcostal region with the beam angled slightly cephalad with the transducer indicator directed toward the patient's head (Figure 11). This orientation will not give you a four-chamber view of the heart and will not provide information about gross wall motion abnormalities or gross chamber size enlargement, but it will tell you about the presence of pericardial fluid.

Figure 11. Transducer placement for sagittal, subcostal window.

The transthoracic window can be performed using different views. The one discussed in this section, the parasternal long-axis view, is obtained with the transducer on the chest wall adjacent to the sternal border at approximately the level of the 3rd intercostal space. The transducer is in the plane of the right shoulder→left hip with the indicator directed toward the left hip in the abdominal mode setting (Figure 12). Subtle movements of the transducer will be required to obtain the desired view, once the initial sonographic window is identified (Figure 12). The echocardiographic orientation, unlike the abdominal orientation, has the cephalad direction toward the right of the screen on the long-axis views (Figure 12). This is different from the traditional abdominal/pelvic orientation.

Figure 12. Transducer placement for parasternal long-axis window. The arrow indicates the direction of the probe indicator. Also seen is the normal parasternal long-axis ultrasound window. RV=right ventricle, LV=left ventricle, LVOT=left ventricular outflow tract, AO=aorta, and DA=descending aorta.

References:

39. Rozycki GS, Feliciano DV, Ochsner MD, et al. The role of ultrasound in patients with possible penetrating cardiac wounds: a prospective multicenter study. *J Trauma* 1999;46:543-552.